

Title: The Candy Caper!!

Brief Overview:

In this learning unit, students will be instructed in the four basic statistical skills: range, mean, median, and mode. Once these skills are mastered, they will then be responsible for gathering data using jelly beans. Class results will be represented in the form of a line graph, as well as a scatter plot and histogram. Finally, each student will be required to compose a business letter informing the candy company of our results. This letter will be sent to the company through the Internet.

Links to NCTM Standards:

- **Mathematics as Problem Solving**

Students will demonstrate their ability to solve mathematical problems by using their newly mastered statistical skills together with the data gathered from the jelly bean activity.

- **Mathematics as Communication**

By sharing their discoveries, discussing their results and writing a letter explaining their findings, students will be communicating mathematically.

- **Mathematics as Reasoning**

Through deductive analysis, students will demonstrate their ability to reason mathematically by making predictions about the various graphs.

- **Mathematical Connections**

By correlating the unit to such disciplines as Computer Science and Language Arts, students will demonstrate their ability to make mathematical connections.

- **Computation and Estimation**

Students will demonstrate their ability to use basic math skills to solve statistical problems. Likewise, they will be determining whether or not a solution is feasible.

- **Patterns and Functions**

Students will be able to represent data in a number of graphs as well as a table.

- **Statistics**

Students will demonstrate their ability to collect and organize data. They will display this data using graphs and charts. Students will also survey their classmates to determine the most popular flavor.

- **Probability**

Students will demonstrate their ability to predict and find probabilities in real-life situations.

Grade/Level:

Grade 6/7

Duration/Length:

This activity should take four days, including the assessment.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Addition, subtraction, multiplication and division of whole numbers
- Construction of a line graph, given specific data
- The ability to create a survey to compile statistical data
- Using the TI-83 calculator
- Using the Internet

Objectives:

Students will be able to:

- compute range, mean, median and mode of gathered information.
- represent data in the form of a line graph.
- demonstrate ability to use graphing calculators to form a scatter plot and a histogram.
- compose an e-mail letter through the use of the Internet.
- create a survey to compile statistics of classmates' favorite jelly bean flavor.

Materials/Resources/Printed Materials:

- Bag of *Jelly Belly* Jelly Beans per student
- TI-83 calculator
- Attached worksheets
- Computers with Internet Access
- Textbook

Development/Procedures:

Day 1:

- Introduce skills (range, mean, median, mode). Allow students enough time to practice individually with the aid of textbook.
- Present activity (Worksheet 1) and allow for brief discussion and any questions.
- Each student must count and record the number of jelly beans according to flavor using Worksheet 1.

Day 2:

- Class shares individual results. These results are recorded on the class chart located on the overhead projector. (Overhead 1 - Class Results)
- Each student will use these results to calculate the range, mean, median, and mode for each flavor.
- These results will be used to construct a line graph (Worksheet 2).

Day 3:

- Students will use graphing calculators to further display their results in the form of a scatter plot and a histogram. (Instructions for this activity are located on Worksheet 3.)
- Calculators will be turned in to the instructor at the end of the class period.

Day 4:

- Each student will compose a letter to the Jelly Belly candy company which will contain a brief explanation of the class activity as well as the results. These letters will be sent to the company via the Internet.

Performance Assessment:

Students will be assessed daily based on their performance. Both technological ability as well as written worksheets will be used to evaluate the student's progress. The scoring rubric for this activity is included in the attached pages.

Extension/Follow Up:

As a follow up to this activity, students will work in pairs to create a survey to determine the most popular flavors in an average bag of jelly beans.

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Worksheet 1

I. Jelly Bean Tally

Group the jelly beans according to flavor (using the list on the back of the jelly bean bag). Record your findings in the chart below. Use the exact sequence of flavors as it appears on the bag.

[illegible]

Class Results -Overhead 1

Jelly Bean Flavors

Students																				
1.)																				
2.)																				
3.)																				
4.)																				
5.)																				
6.)																				
7.)																				
8.)																				
9.)																				
10.)																				
11.)																				
12.)																				
13.)																				
14.)																				
15.)																				
16.)																				
17.)																				
18.)																				
19.)																				
20.)																				

Range: _____

Median: _____

Mode: _____

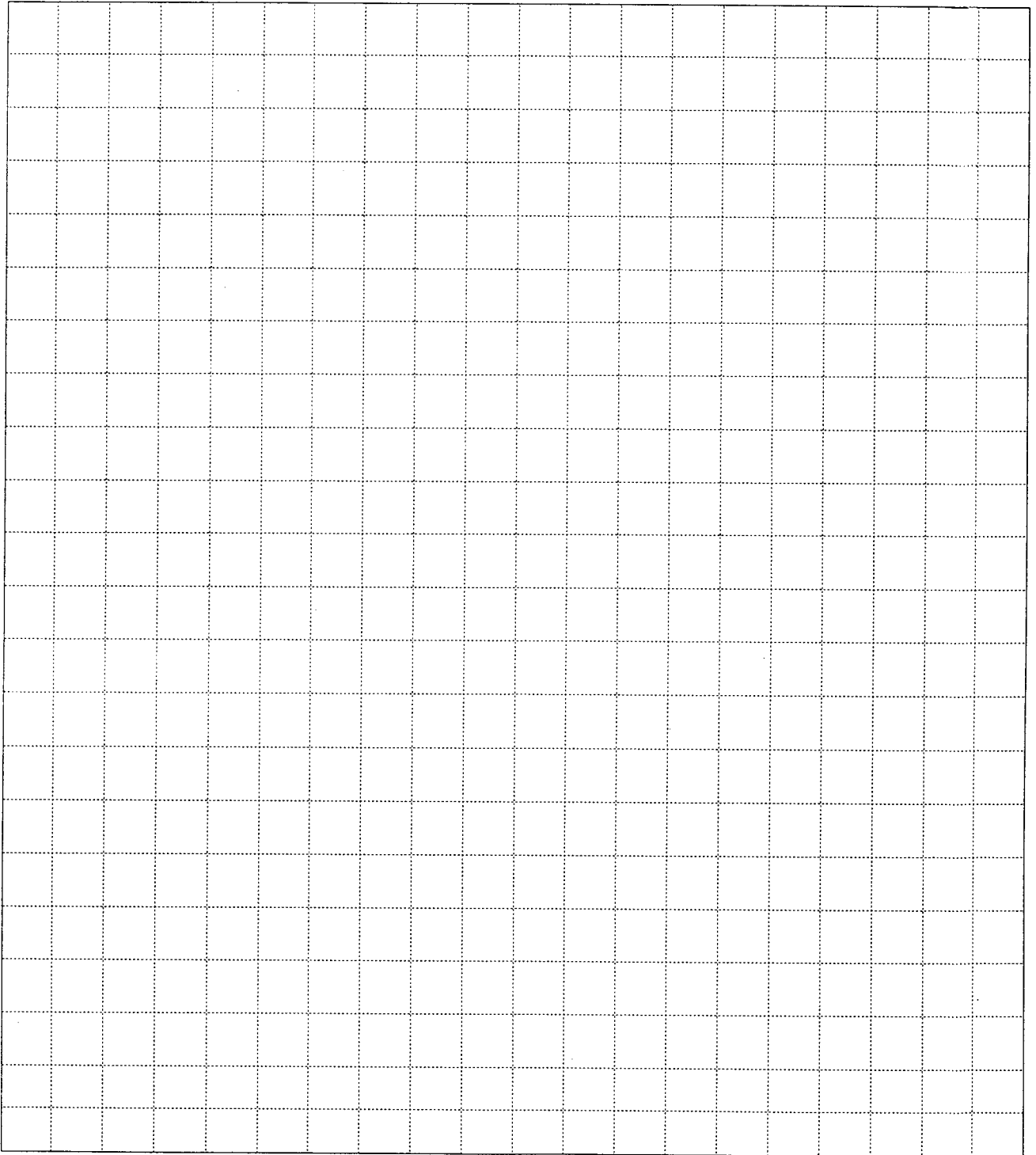
Mean: _____

Worksheet 2

Label the X-axis, **Jelly Bean Flavors.**

Label the Y-axis, **Class Mean.**

Make your headings outside of the graphing area.



Name: _____

Date: _____

Worksheet 3

We will be organizing your data in the form of lists using our TI-83 calculators. Follow the instructions very carefully. All button names are in bold print as well as quotation marks. If you run into trouble, raise your hand.

- 1.) Press the "**Stat**" button, then press "**Enter**"
- 2.) Input the number of jelly beans, in the order that they appear on your chart, under L1.
- 3.) Input the classes' number of jelly beans under L2.

Now you are ready to set your window.

- 4.) Press "**Window**"
- 5.) To choose your scale, take your smallest value on L1, and subtract 10 from it. This value is your Xmin.
- 6.) Then choose your highest value from L1 and add 10 to it. This is your Xmax.
- 7.) Set your Xscl to 5.
- 8.) Repeat step 6 using the values from L2 and insert this value into your Ymin.
- 9.) Repeat step 7 using the values from L2 and insert this value into your Ymax.
- 10.) Set your Yscl to 5.

You are now ready to create your scatter plot.

- 11.) Press "**2nd**" then "**Stat Plot**"
- 12.) Press "**Enter**"
- 13.) Move cursor to Plots on.
- 14.) Move your cursor down and choose the scatter plot icon. (the first icon under Type)
- 15.) Press "**Graph**"

Your scatter plot should appear on the screen. How close were your values from the class mean?

Now it is time to create your histogram.

- 16.) Press “**2nd**”, then “**Stat Plot**”
- 17.) Press “**Enter**”
- 18.) Move the cursor down to Type and over to the Histogram Icon
(the Third icon)
- 19.) Press “**Enter**”
- 20.) Press “**Graph**”

Your histogram should appear on the screen.

On the lines below, compare and contrast the two types of graphs. Which do you prefer and why?

Worksheet 4

Write a business letter to the Jelly Bean Company. Be sure to include in this letter an explanation of the activity as well as your own results. Stress the types of technology we have used in this assignment. Include your personal feelings about the project as well as your excitement about eating the delicious jelly beans! Once you are finished, present your letter to your teacher before you e-mail it to the company.

Please remember to use the format of a business letter. A sample business letter is included below.

	Your Name School Address City, State, Zip Code
Company Name Street Address City, State, Zip Code	
Date	
Salutation: (Dear Sirs:)	
Introduction - 2/3 sentences	
Body of the Letter - 4/5 sentences	
Conclusion - 2/3 sentences	
Closing, (Sincerely, Best Regards, etc.)	
Your Name	

Rubric for Scoring Jelly Bean Activity

Mathematics

3 points -

- Student fully participated in each activity each day.
- Student showed clear understanding of skills: range, mean, median, and mode.
- Student performed accurate calculations of range, mean, median, and mode.
- Student displayed ability to graph results accurately.
- Student created a survey to tally his/her classmates' favorite jelly bean flavor.

2 points -

- Student participated in most of the activities.
- Student showed an understanding of range, mean, median and mode.
- Student made accurate calculations with few errors.
- Student made minor errors in graphing.
- Student made minor mistakes, creating a survey to tally his/her classmates' favorite jelly bean flavor.

1 point -

- Student's participation is poor.
- Student showed limited understanding of range, mean, median and mode.
- Student's calculations were minimal.
- Student's graphs were not accurate.
- Student's survey contained a number of errors.

Rubric for Scoring Jelly Bean Activity

Language Arts

3 points -

- Student fully participated in writing activity.
- Student composed the letter successfully.
- Student successfully sent the letter via the Internet.

2 points -

- Student participated in most of the writing activity.
- Student made minor mistakes in composing and sending the corporate letter.

1 point -

- Student's participation is poor.
- Student was unable to compose letter without numerous errors.
- Student was unable to access the Internet without teacher supervision.